Honeywell

Installation Instructions for the **Honeywell Hawk™ Resolvers 3-inch Series, Multiple Configurations**

50075128

Issue A

NOTICE

Ensure the resolver is properly installed. Improper installation may result in greater resolver errors, especially with the smaller resolvers.

Ensure the following:

- Use a flexible coupling (no backlash) to attach the resolver shaft to the application shaft. Flexible couplings prevent excessive side loading of the resolver which reduce bearing life, and possibly cause greater error.
- Mounting screw torque is minimized to reduce mounting stresses.
- The resolver is mounted to a pilot diameter and is secured by multiple screws or mounting clamps.
- The resolver is not installed in close proximity to permanent magnets, solenoids and motors. Exposure to magnetic fields could impact resolver function.
- Galvanic corrosion is considered when selecting any material which will come into contact with the resolver (e.g., flex coupling, mounting surface, mounting clamps).
- The stator to housing clearance is between 0.0002 in to 0.0007 in.
- An adhesive (which is compliant over the expected temperature range), is used to fix the rotor to the shaft and the stator to the housing.
- The rotor and stator are mounted and rotated concentrically about an axis.
- The axial offset between the rotor and the stator is minimized (<2% stack height).
- The radial offset between the rotor and the stator is minimized (<0.001 in).
- The rotor/stator tilt is minimized.
- The mounting shoulders are perpendicular to the bore and the shafts are within 0.0005 in.
- The application mounting diameter matches the resolver hub/sleeve CTE (Coefficient of Thermal Expansion) as closely as possible to reduce stresses over temperature.
- The rotor and the stator are not press fit in place.

Table 1. Operating Specifications (At 25 °C [77 °F].)

Characteristic	Parameter
Speed	1X; 1X and 16X
Excitation voltage range	3 V to 15 V
Excitation frequency range	800 Hz to 5000 Hz
Input current	20 mA to 40 mA
Input power	0.03 W to 0.09 W
Electrical load	100 kOhm min.
Phase shift: 1X 16X	 10° 20° to 25°
Accuracy: 1X 16X	 ±420 arcsec (1800 arcsec in dual speed variants) ±25 arcsec (3 V to 15 V and 800 Hz to 2500 Hz)
Angular range	360°+
Transformation ratio: 1X 16X	 1.0 0.25
Operating temperature range	-50.8 °C to 93.3 °C [-60 °F to 200 °F]

Table 2. Mechanical Specifications (At 25 °C [77 °F].)

Characteristic	Parameter
Mounting concentricity	<0.0005 in
Primary winding	rotor
Friction torque	2.5 oz in
Shaft runout	<0.0015 TIR[1]
Shaft radial play	≤0.0006 in with 4 oz load
Shaft end play	≤0.0005 in with 8 oz load
Weight: D27B14XGABNTB, S27B14XGABNYG D30D12XGASNTB D30H04XGAG4TB D30P12XGASNTB	 0.44 lb max. 1.6 lb max. 3.5 lb max. 0.8 lb max.

[1]TIR stands for Total Indicator Runout.

Table 3. Environmental Specifications

Characteristic	Parameter
Vibration	MIL-S-81963B, Section 3.7.1, 15 g, 10 Hz to 2000 Hz, 4 hr each on 3 axes
Shock	MIL-S-81963B, Section 3.7.2, 50 g, 11 ms duration, 3 axes, 2 directions, 5 impacts each axis/direction, 30 total
Storage temp.	MIL-STD-810G, 501.5 and 502.5, -50.8 °C to 93.3 °C
Humidity cycle	MIL-STD-202 G Condition 106
Thermal cycle	RTCA/DO-160D Section 5, -50.8 °C to 93.3 °C extreme temperatures 10 °C per minute transition
Sealing (fully housed)	IP64 NEMA
EMC	MIL-STD-461 RS-101, RE-101, RE-102
Outgassing	SP-R0022 (NASA outgassing requirements)
Endurance	MIL-hdbk-218 (6.2): 1200 hr at 1150 rpm)
Material: housing shaft	 416 stainless steel 303 stainless steel

Figure 1. Mounting Dimensions (For reference only: in.)

S27B14XGABNYG, D27B14XGABNTB

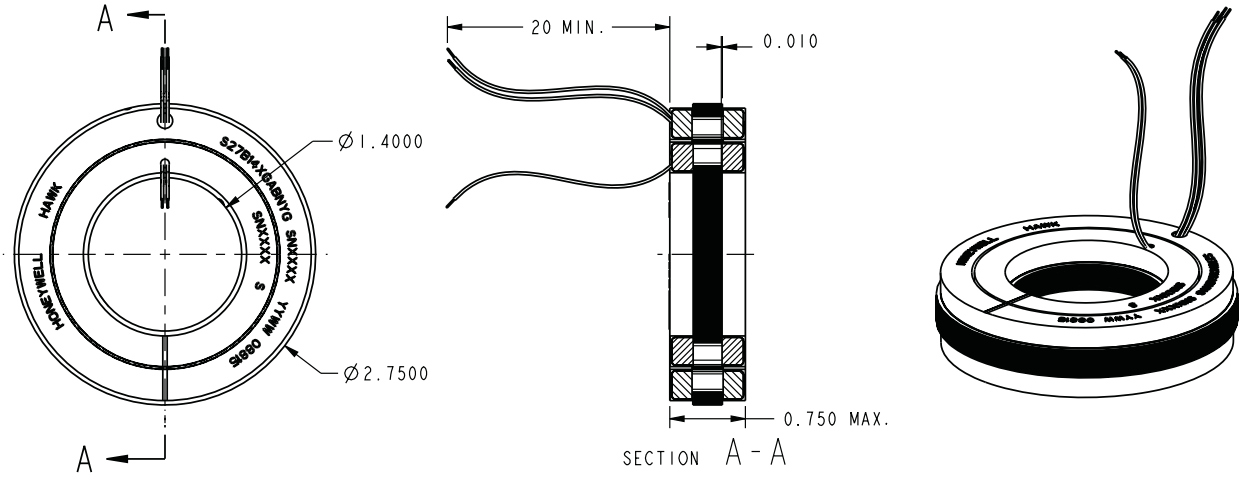
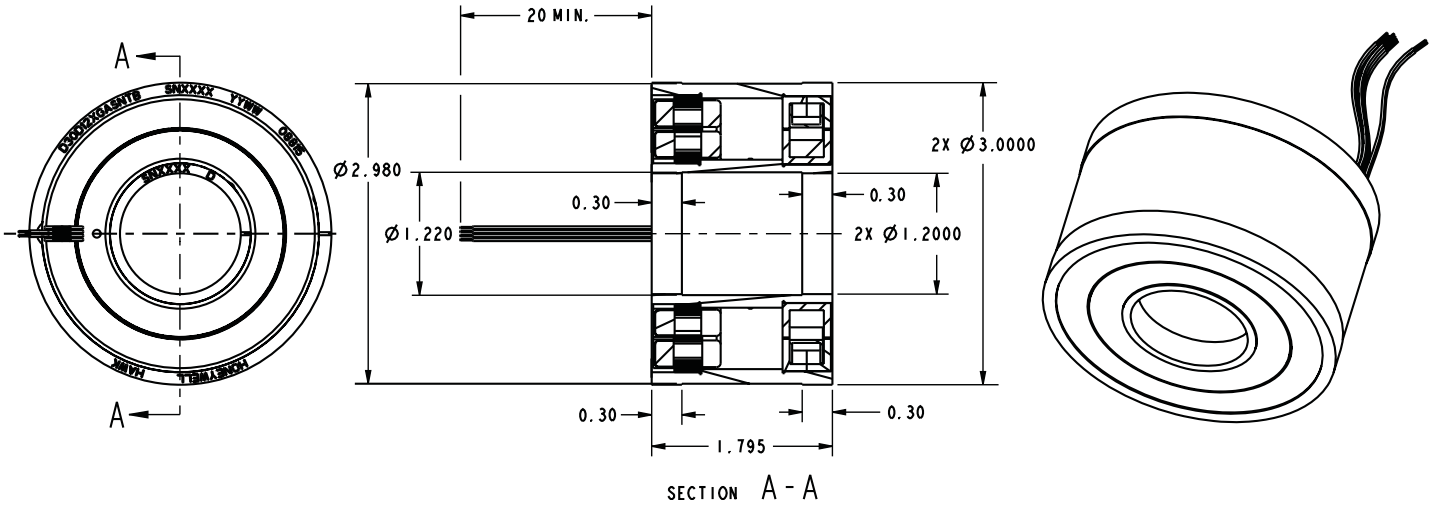
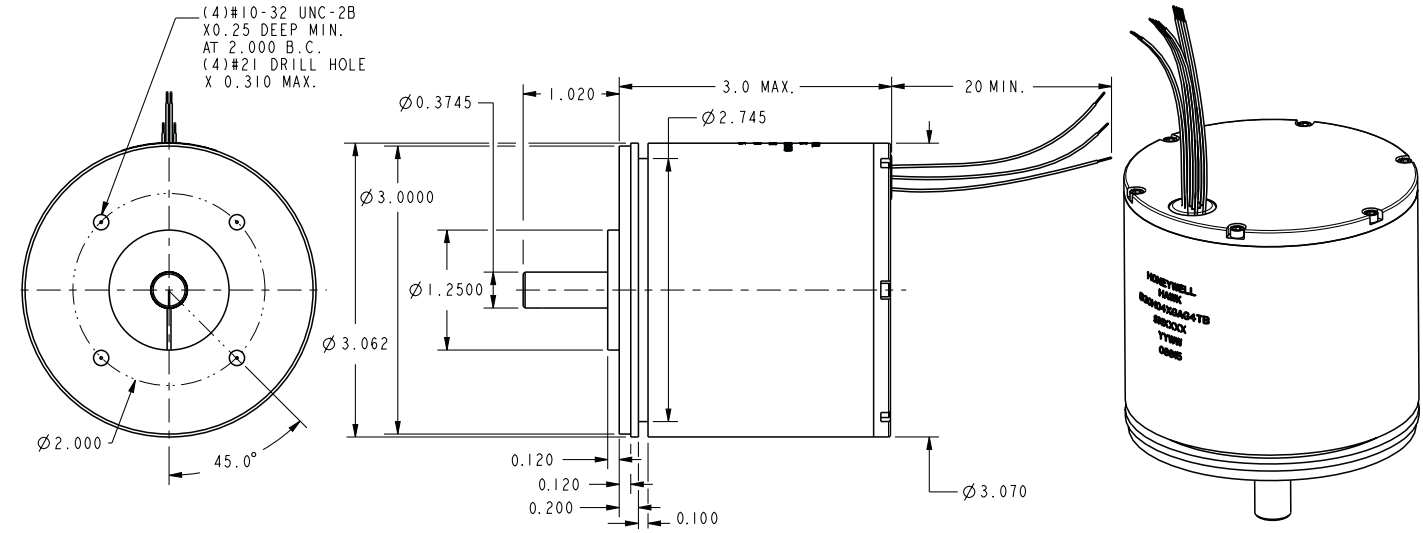


Figure 2. Mounting Dimensions (Continued)

D30D12XGASNTB



D30H04XGAG4TB



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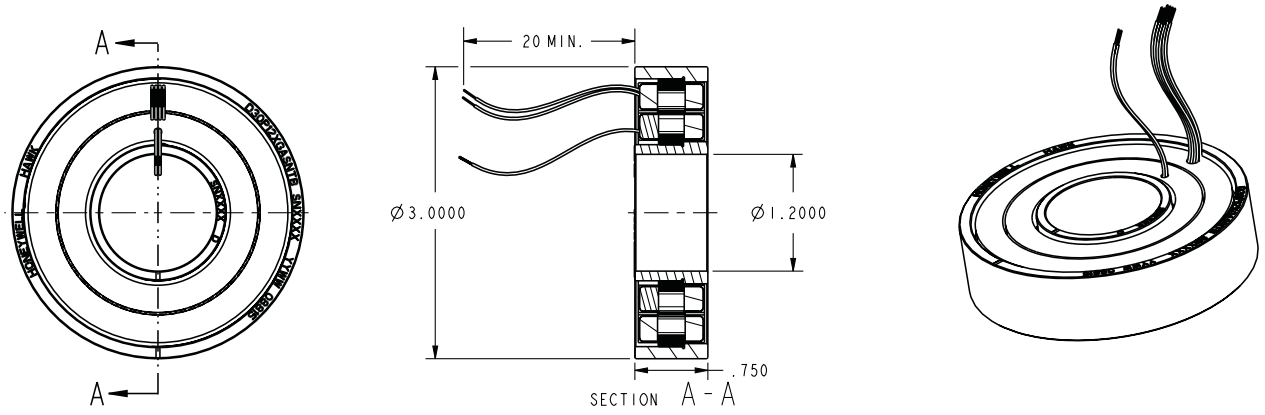
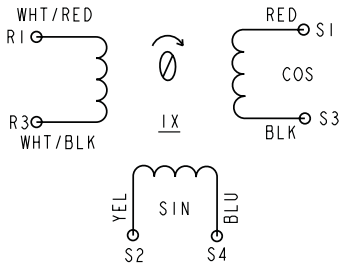


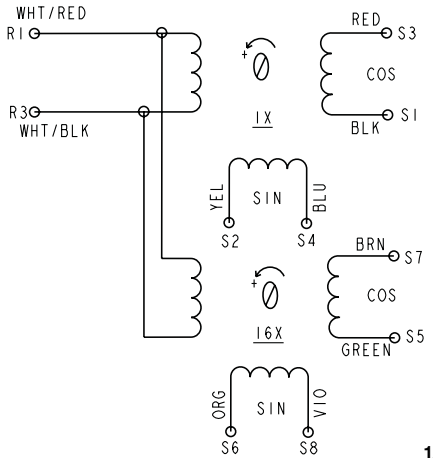
Figure 3. Electrical Schematics (Positive Direction of Rotation Clockwise, Viewed from Shaft End) and Phase Equations

S27B14XGABNYG



1X
ES1 - S3 = KERI - R3 COS Θ
ES2 - S4 = KERI - R3 SIN Θ

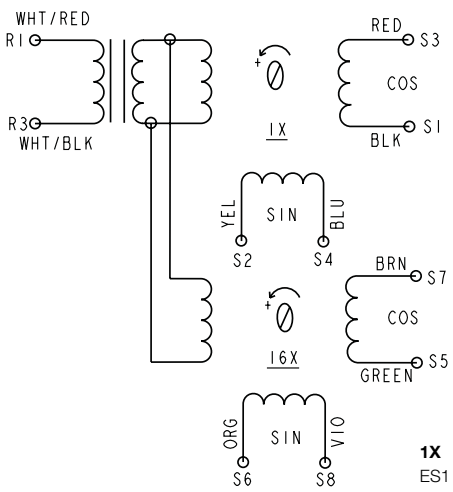
D27B14XGABNTB, D30P12XGASNTB



1X
ES1 - S3 = KERI - R3 COS Θ
ES2 - S4 = KERI - R3 SIN Θ

16X
ES5 - S7 = KERI - R3 COS 16Θ
ES6 - S8 = KERI - R3 SIN 16Θ

D30D12XGASNTB, D30H04XGAG4TB



1X
ES1 - S3 = KERI - R3 COS Θ
ES2 - S4 = KERI - R3 SIN Θ

16X
ES5 - S7 = KERI - R3 COS 16Θ
ES6 - S8 = KERI - R3 SIN 16Θ

Figure 4. Nomenclature

For example, a **D27B14XGABNTB** catalog listing defines a Honeywell Hawk™ 3-Inch Series Resolvers, dual speed (1X and 16X), 2.75 in OD, 1.4 in ID, pancake bare configuration, 7 V, 2500 Hz, leadwire, bare mounting type, no bolt pattern, 0.25 transformation ratio, ±25 arcsec accuracy, stainless steel hub and housing.

Speed	Outside Diameter (Pancake Configuration only)	Configuration	Inside Diameter (ID) (includes shaft OD)	Voltage	Frequency	Connection	Mounting Type	Bolt Pattern (flanged housing/ hub only)	Transformation Ratio (Vout/Vin)	Accuracy over 360°	Housing Material	Customer Specified
D Dual speed (1X and 16X)	**27** 2.75 in	**B** Pancake: bare	**12** 1.2 in	**T** 5 V	**A** 400 Hz	**A** Leadwire	**B** Bare	**4** Four bolts equally spaced	**T** 0.25 (dual speed, 1X and 16X)	**A** ±20 arcsec (16X or dual speed)	**Blank** Stainless steel	**xxx** Customer Specified
M Multi speed (16X)	**30** 3.00 in	**P** Pancake: simple housed; no transformer, not redundant	**14** 1.4 in	**X** 7 V	**B** 800 Hz	**B** Connector on unit	**F** Flange	**6** Six bolts equally spaced	**X** 0.45 (single speed, 1X)	**B** ±25 arcsec (16X or dual speed)	**T** Titanium	
S Single speed (1X)		**D** Pancake: simple housed; transformer		**Y** 10 V	**E** 1000 Hz	**C** Customer specified	**G** Series 11 NEMA servo-mount enclosure	**N** None	**Y** 1.0 (single speed, 1X)	**C** ±30 arcsec (16X or dual speed)		
		E Pancake: simple housed; no transformer, redundant		**Z** 26 V	**F** 2000 Hz	**D** Connector on cable	**S** Sleeve	**C** Customer specified		**D** ±40 arcsec (16X or dual speed)		
		F Pancake: simple housed; transformer, redundant		**C** Customer specified	**G** 2500 Hz		**C** Customer specified			**E** ±60 arcsec (16X or dual speed)		
		G Fully housed: no transformer, not redundant			**H** 5000 Hz					**F** ±240 arcsec (16X or dual speed)		
		H Fully housed: transformer, 360°+ mechanical, not redundant			**C** Customer specified					**G** ±420 arcsec		
		K Fully housed: transformer, 360°+ mechanical, redundant								**H** Customer specified		

Honeywell Hawk™ Resolvers
3-inch Series, Multiple Configurations

Issue A

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⚠ WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

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